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ENTOMOLOGY.<sup>1</sup>

**Phengodini.**—The AMERICAN NATURALIST for September, p. 853, contains an interesting account of some of the metamorphoses observed in *Phengodes laticollis* Horn., by G. F. Atkinson. From the descriptions of the form of the female, its mode of life, and also of the egg, is but a counterpart of all these stages observed in *Zarhipis*. Indeed, without more definite and microscopic details, the descriptions of these stages in *Phengodes* would do quite as well for *Zarhipis*, showing how close these genera are.

On page 855 the description of the egg of *Phengodes* appears, and it applies so well to that of *Zarhipis* as to make me think there are no differences in the eggs of the species of the two genera; though a microscopic comparison would most likely reveal distinctive characters, and which must be done by some one before an analysis of the *Phengodini* can be written. The eggs of *Zarhipis* are round, smooth, semi-opaque, tinged with yellowish; size, 4 mm. diameter. They are not much unlike small slugs' eggs. As the sexes are so much unlike in form, the next interesting point to discover is at what stage is the sexual character first perceptible. Mr. Albert Kœbele and myself have each a nursery of broods of larvæ of *Zarhipis* that have gone through one moulting, and they all maintain the same form, and which is very like their mother.

Mr. Atkinson, on page 855, says, "The luminosity in this case is of sexual significance, attracting the males at night." This is a good observation, which explains a certain mode in *Phengodes*, but it would not do to say that that is the method in *Zarhipis*, when its habit is known to be diurnal. Mr. Kœbele informs me that he captured two examples of a *Zarhipis* in the night-time, allured by an electric light in the city of Los Angeles. This observation would make it appear that *Zarhipis* is also nocturnal in habit. The composition of the powerfully-diffused electric light is so good an imitation of that of day that it can hardly be considered conclusive testimony, in the face of the known diurnal habit of the insect.

The two sets of observation would go to show, if they are both correct, that *Zarhipis* possesses the double habit of simply flying in the day and seeking at night, at which time there is burning a sexual lamp to guide it, which lamp is a beacon planted upon the goal it is seeking. *Zarhipis* does not visit our gas- and oil-lamps like other *Lampyridæ*, or, rather, has not hitherto been found to do so. The mysteries of the *Phengodini* are still many in number, and it is to the *Lampyridists* of the South we look for the unravelment of those of *Phengodes*, and we in the West have to look after *Pterotus* and *Zarhipis*.—*F. F. Rivers, University of California.*

<sup>1</sup> This department is edited by Prof. J. H. COMSTOCK, Cornell University, Ithaca, N. Y., to whom communications, books for notice, etc., should be sent.

**Senses of Insects.**—M. A. Forel<sup>1</sup> contributes a most interesting and exhaustive account of experiments made by himself and many others on the much-discussed problem of the senses of insects.

(1) In regard to the *sight* of ants, he notes especially these three conclusions: (*a*) They perceive light, and particularly ultra-violet (Lubbock); (*b*) they really see the ultra-violet rays, without eyes they are almost indifferent to them, and only respond to solar light more or less intense; (*c*) the dermatoptric sensations are feebler among the ants than in the animals which Graber studied.

(2) After reviewing new and old experiments as to the sense of *smell* in insects, he notes the following general facts: (*a*) In many insects which are essentially directed by sight, as in the Libellulids and Cicadas, the antennæ are rudimentary, and the sense of smell likewise. During the night these insects are passive, while during the day they trust to their power of sight, or possibly, in some cigalids, also to hearing; (*b*) the sensitive region, in spite of Graber's protestations, is situated in the antennæ, especially in those parts where the antennary nerve ramifies; (*c*) in certain insects, as in most Diptera, the antennæ serve almost solely for smelling purposes; (*d*) in other cases, however, where they are mobile, as in the Hymenoptera, they are used for detecting their food or their mates at great distances.

(3) As distinct organs of *taste*, M. Forel regards the nervous terminations (*a*) on the proboscis of flies (Leydig), (*b*) on the jaws and on the base of the tongue (Meinert), (*c*) on the end of the tongue (Forel), and (*d*) on the palate or on the epipharynx (Wolff).

(4 and 5) Forel's results as to *hearing* are, as yet, too negative to admit of notice. He finally discusses the sense of *touch* in its various manifestations, and the last chapter of his interesting memoir discusses the relation of the five senses to the general psychical life of insects.—*Four. Roy. Micr. Soc.*, 1887, p. 577.

#### ZOOLOGY.

**Fresh-Water Sponges.**—The *Proceedings* of the Philadelphia Academy of Natural Sciences for this year contain Mr. Edward Potts's monograph of "Fresh-Water Sponges." This paper contains, besides directions for collection and study, a translation of Vejdowsky's recent diagnosis of European Spongillids, a synopsis of all known North American species, and a *résumé* of all the known species of the world. The fifty-eight species are grouped in the genera *Spongilla*, *Meyenia*, *Heteromyenia*, *Tubella*, *Paromela*, *Carterius*, *Uruguaya*, *Potamolepis*, and *Lubomirskia*. The North American fauna embraces *Spongilla aspinosa*, *S. lacustris*, *S. fragilis*, *S. igloviformis* (nov.), *S. mackaya*, *S. novæ terræ*, *Mey-*

<sup>1</sup> Rec. Zool. Suisse, iv., 1887, pp. 161-240.